

CLAIMS

What is claimed is:

1. An intervertebral spacer device, comprising:
first and second plates, said plates being disposed in a spaced apart relationship such that a plate surface of said first plate faces a plate surface of said second plate, said facing surfaces being inner surfaces, and alternative faces of each plate being outer surfaces; and
at least one restoring force providing element disposed between the inner surfaces of said first and second plates, and disposed such that a compressive load applied to the outer surfaces of said first and second plates is counteracted by said at least one restoring force providing element, said at least one restoring force providing element including at least one wave washer selected from the group consisting of a conical-shaped wave washer, a semispherical-shaped wave washer, and a wave washer having two wide ends separated by a narrower centrally bored portion from which an upwardly extending circumferential extent portion extends to form one of the wide ends and from which a downwardly extending circumferential extent portion extends to form the other of the wide ends.
2. The intervertebral spacer device of claim 1, wherein at least one of said first and second plates comprises a post mounted to its inner surface, the post having a plurality of laterally extending spokes, and the at least one wave washer is secured to the at least one of said first and second plates with a circumferential extent of the at least one wave washer being maintained between the spokes and the at least one of said first and second plates.

3. The intervertebral spacer device of claim 1, wherein at least one of said first and second plates comprises a flanged fastener mounted to its inner surface, the flanged fastener having a post portion and a flanged portion, and wherein the post portion has a diameter smaller than a diameter of a central bore of the at least one wave washer, and a length greater than a thickness of a portion of a circumferential extent, of the at least one wave washer, surrounding the central bore, and wherein the flanged portion has a diameter greater than the diameter of the central bore, and wherein the at least one wave washer is secured to the at least one of said first and second plates with the circumferential extent portion surrounding the central bore being maintained between the flanged portion and the at least one of said first and second plates.

4. The intervertebral spacer device of claim 1, wherein the at least one wave washer has a circumferential extent thickness that is radially varying.

5. The intervertebral spacer device of claim 1, wherein the at least one wave washer has a circumferential extent that is radially wavy.

6. The intervertebral spacer device of claim 1, wherein the at least one wave washer has a circumferential extent that has at least one concentric groove.

7. The intervertebral spacer device of claim 6, wherein the at least one concentric groove has a depth and a width, and wherein at least one of the width and the depth varies along a length of the concentric groove.

8. The intervertebral spacer device of claim 1, wherein the at least one wave washer has a circumferential extent having at least one radially extending wave valley having a depth and a width, and wherein at least one of the depth and the width of the valley radially varies.

9. The intervertebral spacer device of claim 1, wherein the at least one wave washer comprises a central bore and a doubled circumferential extent extending from the central bore, the doubled circumferential extent having the upwardly extending circumferential extent portion and the downwardly extending circumferential extent portion.

10. The intervertebral spacer device of claim 9, wherein at least one of the portions is conical-shaped.

11. The intervertebral spacer device of claim 9, wherein at least one of the portions is semispherical-shaped.

12. An artificial intervertebral disc, comprising:
first and second plates disposed to provide opposed respective inwardly facing support surfaces of said plates, and to provide respective outwardly facing vertebral body contact surfaces of said plates; and
at least one wave washer disposed between the inwardly facing support surfaces such that a compressive load applied to the outwardly facing vertebral body contact surfaces is resisted by said at least one wave washer; wherein
said at least one wave washer includes a central bore forming a curvate socket; and
wherein
at least one of said first and second plates includes on its inwardly facing support surface a semispherical protuberance that is rotatably and angulatably couplable to the curvate socket such that the plates are rotatable and angulatable relative to one another thereby.

13. The artificial intervertebral disc of claim 12, wherein the semispherical protrusion comprises a radially deflectable semispherical portion and the curvate socket has an interior volume and an opening leading to the interior volume, the curvate socket accommodating the semispherical portion for free rotation and angulation therein, the semispherical portion fitting through the opening only when radially deflected, the semispherical portion being adapted to receive a deflection preventing element that when applied to the semispherical portion prevents the semispherical portion from fitting through the opening.

14. The artificial intervertebral disc of claim 13, wherein the semispherical protuberance comprises at least one radial slot such that the semispherical protuberance is radially deflectable upon the application of a radially inwardly directed force.

15. The artificial intervertebral disc of claim 14, wherein the semispherical protuberance further comprises an axial bore into which the deflection preventing element is disposable to prevent the radial deflection of the semispherical protuberance.

16. The artificial intervertebral disc of claim 12, wherein said at least one wave washer is selected from the group consisting of a ring-shaped wave washer, a spiral-shaped wave washer, a conical-shaped wave washer, and a semispherical-shaped wave washer.

17. An artificial intervertebral disc, comprising:
first and second plates disposed to provide opposed respective inwardly facing support surfaces of said plates, and to provide respective outwardly facing vertebral body contact surfaces of said plates; and
at least one wave washer rotatably coupled to the inwardly facing support surface of at least one of said first and second plates by a wave washer securing element such that the plates are made rotatable relative to one another thereby, and such that a compressive load applied to the outwardly facing vertebral body contact surfaces is resisted by said at least one wave washer.

18. The artificial intervertebral disc of claim 17, wherein the wave washer securing element comprises a post having at least one laterally extending spoke, and said at least one wave washer is secured to the at least one of said first and second plates with a circumferential extent of said at least one wave washer being maintained between the at least one laterally extending spoke and the at least one of said first and second plates.

19. The artificial intervertebral disc of claim 17, wherein the wave washer securing element comprises a flanged fastener having a post portion and a flanged portion, and wherein the post portion has a diameter smaller than a diameter of a central bore of said at least one wave washer, and a length greater than a thickness of a portion of a circumferential extent of said at least one wave washer surrounding the central bore, and wherein the flanged portion has a diameter greater than the diameter of the central bore, and wherein said at least one wave washer is secured to the at least one of said first and second plates with the circumferential extent portion surrounding the central bore being maintained between the flanged portion and the at least one of said first and second plates.

20. The artificial intervertebral disc of claim 17, wherein said at least one wave washer is selected from the group consisting of a ring-shaped wave washer, a spiral-shaped wave washer, a conical-shaped wave washer, and a semispherical-shaped wave washer.